BSC 4422- Biotechnology

General Information – Spring 2017

READ AND KEEP THIS SHEET FOR FUTURE REFERENCE

1. Instructor: Paul Sharp PhD, Office OE 229, Office hours: Tues. (3:45-5:00PM)
   You may e-mail me at psharp@fiu.edu. Thurs. (3:45-5:00PM)

2. Text for BSC 4422: Thieman and Palladino. *Introduction to Biotechnology*, 3rd ed.

   Course Objectives: Students will learn modern concepts of biological, biochemical, ecological, engineering, entrepreneurial, and ethical aspects of biotechnology in industry, agriculture, and medicine.

3. Attendance: Attendance will not be recorded; however, the increased difficulty you will experience on exams after you miss lectures is a stiff penalty. **PLEASE BE ON TIME!**

4. Hour exams in BSC 4422:

   Mechanics: The hour exams will be held in the regularly scheduled lecture periods (see lecture schedule). Format may include multiple choice and short answer. You will be expected to recall material learned earlier in the semester to answer more challenging questions as the information builds from one exam to the next. Students that get a majority of i-Clicker questions correct in lecture will increase the weight of their bonus questions answered correctly on exams. Every exam will have 2 bonus questions.

   Emphasis: The hour exams will stress lecture and reading assignments. Materials covered in lectures will be emphasized, but some (probably few) questions on material not covered in lecture will be taken from the book and/or journal articles.

   Other helpful information: The questions will call for specific knowledge. You should take care to **read the question carefully** and to **answer the question asked**. Note carefully that considerable memorization will be necessary in preparation for the exams, but you will also be tested on your ability to think and to use the information you have memorized.

5. Determination of the course grade:
   All grades are based on a 100 point scale (90% = A, 80% = B, 70% = C, etc.)
   No Rounding - No curve - No dropped exams - Non-negotiable
   - Three hour exams each worth 24% totaling 72%
   - Cumulative final exam worth 28%

6. Final exam in BSC 4422: The final exam will be generally similar in format and emphasis to the hour exams. Approximately 1/4 of the final will cover the last 1/4 of the course, and 3/4 will be on the first 3/4.

SYLLABUS MAY BE SUBJECT TO CHANGE

FLORIDA INTERNATIONAL UNIVERSITY

BSC 4422 – LECTURE SCHEDULE Spring, 2017

Text: Thieman & Palladino, *Introduction to Biotechnology*, 3rd ed.

Lect. no.	Date	Subject	Text assign
1	10 Jan	History of Biotechnology / Types of Biotechnology	Chap. 1
2	12 Jan	History of DNA Research / Genes and Genomes	Chap. 2
3	17 Jan	DNA Replication / DNA Translation	Chap. 2
4	19 Jan	Gene Expression Control / Epigenetics	Chap. 2
5	24 Jan	DNA Extraction / Restriction Enzymes / Plasmids / Transformation / DNA Libraries	Chap. 3
6	26 Jan	PCR/ RT-PCR / qPCR / FISH / Southern, Western, and Northern Blotting	Chap. 3
7	31 Jan	DNA microarray/ Sanger Sequencing / Next-generation Sequencing / NCBI	Chap. 3
8	2 Feb	**HOUR EXAM 1**	
9	7 Feb	Protein Biotechnology Products / Protein Structures / Protein Production	Chap. 4
10	9 Feb	Protein Purification methods / Protein Analytic methods / Protein verification	Chap. 4
11	14 Feb	Microorganisms as tools / Food products / Therapeutic proteins / Biofuels	Chap. 5
12	16 Feb	Vaccines / Antibodies / Microbial Genomes / Metagenomics	Chap. 5
13	21 Feb	Microbial Diagnostics / Biotechnology against Bioweapons	Chap. 5
14	23 Feb	Transgenic Plant Cloning Methods / Applications of Transgenic Plants	Chap. 6
15	28 Feb	Genetic Pesticides / Enhanced Nutrition / Biofuels / Plant Pharmacology	Chap. 6
16	2 Mar	**HOUR EXAM 2**	
17	7 Mar	Animals in Research / Transgenic Animals and Cloning Techniques	Chap. 7
18	9 Mar	Transgenic Animals as Bioreactors and Knockouts	Chap. 7
	14 Mar	**Spring Break (University Closed)**	
	16 Mar	**Spring Break (University Closed)**	
19	21 Mar	DNA Fingerprinting / STR Analysis	Chap. 8
20	23 Mar	DNA Fingerprinting Applications	Chap. 8
21	28 Mar	Bioremediation / Microbial Cleanup Reactions / Cleanup Sites and Strategies	Chap. 9
22	30 Mar	Genetically Engineered Organisms for Environmental Cleanup	Chap. 9
23	4 Apr	**HOUR EXAM 3**	
24	6 Apr	Aquatic Biotechnology / Aquaculture and Genetic Technologies	Chap. 10
25	11 Apr	Bioprospecting, Biosensors / Applications of Transgenic Animals	Chap. 10
26	13 Apr	Models of Human Disease / Human Genome Project / Biomarkers	Chap. 11
27	18 Apr	Medical Products / Applications of Biotechnology	Chap. 11
28	20 Apr	Gene Therapy / Regenerative Medicine	Chap. 11
	25 Apr	**FINAL EXAM** *TBA*	

*March 20, 2017: Last day to drop with a DR grade

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